



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Joerg DIETRICH

Examiner: Tho V. Duong

Serial No.: 09/851,432

Group Art Unit: 3743

Filed: May 9, 2001

Title: PLATE HEAT EXCHANGER

RECEIVED

APPEAL BRIEF

APR 02 2003

Assistant Commissioner for Patents  
Washington, D.C. 20231

TECHNOLOGY CENTER R3700

Sir:

Further to the Notice of Appeal filed November 18, 2002, herewith are three copies of Appellants' Brief on Appeal. A check for the statutory fee of \$320.00 fee for filing an Appeal Brief is enclosed. This is an appeal from the decision of the Examiner finally rejecting claims 8, 12, 13 and 15-18, claims 19-24 having been withdrawn from consideration.

03/27/2003 CCHAU1 00000023 09851432

02 FC:1402

320.00 OP

**(1) REAL PARTY IN INTEREST**

The real party in interest in the present application is Linde Aktiengellschaft, to whom the present application is assigned, the Assignment being recorded September 5, 2001, at Reel 012138, Frame 0308-0310.

I hereby certify that this correspondence is being deposited with the U.S. Postal Services as First Class Mail in an envelope addressed to:  
Assistant Commissioner for Patents  
Washington, D.C. 20231 on: 3/18/03  
Name: John M. Johnson  
Signature: John M. Johnson  
Date: 3/18/03

## **(2) RELATED APPEALS AND INTERFERENCE**

There are no known related appeals or interferences.

## **(3) STATUS OF THE CLAIMS**

Claims 1-7 were initially presented for examination, cancelled by Preliminary Amendment and replaced by claims 8-14. Method claims 19-22 are withheld from consideration as not reading on constructively elected invention and claims 9-11, 14, 15 and 18 were cancelled by an Amendment after Final. Independent claim 8 and dependent claims 12 and 13 depended from claim 8, and Independent claim 16 remain in this application for examination. All of these pending claims stand rejected. A copy of all the pending claims is presented in the Appendix.

## **(4) STATUS OF AMENDMENTS AFTER FINAL**

The Advisory Action dated December 3, 2002 stated that claims 8, 12, 13 and 15-18 (actually claims 15, 17 and 18 are cancelled by Applicant) would be entered for purposes of Appeal. If the terminology "in the aluminum being adapted to be welded to an aluminum component of the heat exchanger" were deleted from claim 16. In the Amendment of November 15, 2002 this phrase was deleted.

## **(5) SUMMARY OF THE INVENTION**

Claim 8 of this invention relates to a plate heat exchanger block (1) having a plurality of

aluminum or aluminum alloy sheets (2) that have plurality of heat exchange passages and at least one steel header (3) in communication with at least some of the heat exchange passages defined by the plurality of aluminum or aluminum alloy sheets (2). The exchanger block (1) can not be welded directly to the steel header (3). In order to join the steel header (3) with the aluminum block (1) an intermediate piece (5) is provided, which intermediate piece (5) has a steel part (7) facing the header (3) and an aluminum part (6) facing the housing. The aluminum part (6) and steel part (7) forming intermediate member (5) are explosively bonded together. Consequently, intermediate piece (5) is welded, aluminum-to-aluminum, to at least one of the aluminum housing (1) and aluminum alloy sheets (2), and is also welded, steel-to-steel, to the steel header (3).

A copy of all the pending claims is presented in the Appendix.

## **(6) ISSUES**

The sole issue outstanding in this application is:

- (1) In a rejection under 35 U.S.C. §103, whether claims 8, 12, 13 and 16 are unpatentable over Davidian et al. '662 in view of Takahashi '288, in a the rejection based on not giving the limitation "explosive plating" patentable weight in independent claims 8 and 16.

## **(7) GROUPING OF THE CLAIMS**

For the purpose of this Appeal, dependent claims 12 and 13 stand or fall with the rejection of independent claim 8. Independent claim 8 and independent claim 16 do not stand or fall together because claim 8 is directed to a plate heat exchanger block comprised of the block 1 including the

aluminum or aluminum alloy housing and the header 3, which header is connected to the housing through a connecting piece 5. Claim 16 is directed to a heat exchange header having a connecting piece with a steel side and an aluminum side, wherein the aluminum side is explosively bonded to the steel side and the steel header is welded to the steel side of the connecting piece.

#### **(8) APPELLANTS' ARGUMENTS**

Independent article claim 8 and claims 12 and 13 depended therefrom, and independent article claim 16 remain in this application on appeal, method claims 19-24 having been withdrawn from consideration as having been constructively elected by the original presentation of article claims for prosecution on the merits.

The Final Rejection Examiner gives no patentable weight to the terminology "the parts being explosively bonded together" in claim 8 and "the aluminum of the connecting piece being explosively bonded to the steel of the connecting piece" in claim 16. According to the present invention, composite piece 5 is only made by explosive plating or bonding of aluminum and steel. Appellant's specification at page 2, lines 16-20 sets forth:

"By using fasteners which provide clamping or frictional connections, for example by screwing two components together, it is very difficult, owing to the different thermal coefficients of expansion, to connect the components tightly enough together so that the sealing of the flow pads in the plate heat exchanger is ensured permanently. "

Moreover, the Appellant's specification states:

"aluminum and steel can not be welded to one another at least on an industrial scale, and in the context of this invention such metals are considered non-weldable to one another."

Clearly, Appellant's invention provides an intermediate piece or connecting piece which has steel on one side for welding to a steel header and aluminum on the other side for welding to an aluminum housing or aluminum sheaths forming heat-exchange passages in a housing (whether the "aluminum" is plain aluminum or "aluminum alloy").

Since no patentable weight has been given to the limitation "explosive plating" or explosive bonding in the claims, a structure of forming the claimed device, critical to Appellant's invention, is dismissed as not germane to the issue of patentability. It is respectfully submitted that the steel piece that has been explosively plated with aluminum, and comprises an intermediate piece or connecting piece, is a structural element and that there is no other way to describe this element. The Examiner had no suggestion other than restricting Appellant to method claims in order to achieve consideration of the concept of bonding aluminum to steel by explosive plating. There is no other way to describe a bond formed by an explosion other than to use the terms "explosion" or "explosive." Suppose the term "adhesively bonded" were used to describe an element having two parts held together by adhesive, or the term "fastened together" to describe two parts held together by fastener or "mechanically deformed" to describe two parts held together by mechanical deformation. These terms are certainly acceptable to define structure, accordingly it is also appropriate in an article or apparatus claim to recite that two parts are "explosively bonded together." Clearly, this recitation is

structural.

Accordingly, it is respectfully requested that the Board reverse the Examiner's position that no patentable weight should be given the terms "explosive plating" or "explosive bonding."

With the explosive plating being ignored as a limitation, claims 8, 12, 13 and 16 were finally rejected as unpatentable over Davidian et al. '662 in view of Eiji '288. However, there is no element in Davidian et al. '662 which corresponds in any way to Appellant claimed to intermediate member 5 (claim 8) or connecting piece 5 (claim 16). Consequently, inserting a connecting piece is taught only by Appellant's own disclosure. In Davidian et al. '662, the headers 1 are shown attached directly to a housing 7 having corrugations 6. There is no intermediate member whatsoever disclosed. Only Appellant discloses an intermediate member.

The Examiner recognizes this and thus attempts to cure this deficiency with Eiji '288, however, it is respectfully submitted that there is no disclosure of just how the steel member 4 and the aluminum member 5 of Eiji '288 are themselves held or bonded together. The Abstract of Eiji '288 merely states that the steel materials are joined to one another and the aluminum members are joined to one another, but there is no disclosure of how the steel material 4 and aluminum material 5 are joined to one another, other than being "so laminated" that they come into contact with one another. Appellant specifically states that his aluminum piece 6 is explosively plated or bonded to his steel piece 7 so as to form an integral unit. Clearly, the disclosure of Eiji '288 is deficient in explaining the bond between steel member 4 and aluminum member 5.

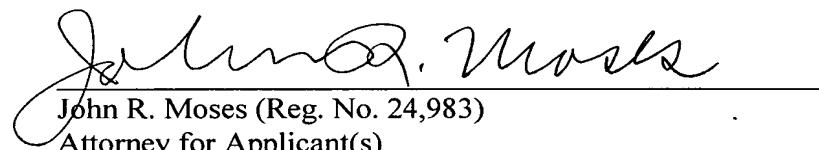
It is respectfully submitted that it is improper for the Examiner to ignore Appellant's explosive bonding limitation in order to justify combining Davidian et al with JP'288.

Clearly, there is no teaching or suggestion in Davidian et al. '662 or in Eiji '288 that an explosive plating or explosive bond.

#### **(9) Conclusion**

In view of the arguments and authorities presented above, Appellants request that the Examiner's action in making and maintaining the Rejection under 35 USC §103 be reversed and that the application be allowed.

Respectfully submitted,



John R. Moses (Reg. No. 24,983)

Attorney for Applicant(s)

MILLEN, WHITE, ZELANO & BRANIGAN, P.C.

Arlington Courthouse Plaza I, Suite 1400

2200 Clarendon Boulevard

Arlington, Virginia 22201

(703) 812-5309 [Direct Dial]

(703) 243-6410 [Facsimile]

Internet Address: [moses@mwzb.com](mailto:moses@mwzb.com)

Filed: March 18, 2003

## APPENDIX

8. (Twice Amended) A plate heat exchanger block comprising: an aluminum or aluminum housing, at least partly within said housing a plurality of aluminum or aluminum alloy sheets (2) of at least partially corrugated metal arranged parallel to one another and forming a plurality of heat-exchange passages, at least one steel header (3) in communication with at least some of the heat-exchange passages, wherein at least two parts (1, 2, 3) of the plate heat exchanger block consist essentially of aluminum metallic materials that cannot be welded to one another and wherein the plate heat exchanger block includes an intermediate piece (5) between the header (3) and the heat exchange passages (2) containing the plurality of sheets, the intermediate member having a steel part facing the header and an aluminum part facing the housing, the parts having been bonded together by explosive plating wherein the intermediate piece is welded, aluminum to aluminum, to at least one of the (a) the housing, and (b) the corrugated sheets.

12. A plate heat exchanger according to claim 8, wherein sheets (2) consist essentially of aluminum.

13. A plate heat exchanger according to claim 8, wherein header (3) consists essentially of steel.

16. (Twice Amended) A heat exchange header for attachment to a heat exchanger having aluminum components, the heat exchange header consisting essentially of steel and including a connecting piece having first and second sides, the connecting

piece consisting essentially of steel on one side and consisting essentially of aluminum the other side the aluminum being explosively bonded to the steel, said header being welded to the steel side of said connecting piece.